Nova Scotia
Department of
Agriculture and Marketing

Lowbush Blueberry

LOWBUSH BLUEBERRY

PRODUCTION AND MARKETING

IN NOVA SCOTIA

A SITUATION REPORT - 1989

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INTRODUCTION

The lowbush blueberry has developed from humble beginnings into one of the most important horticultural crops in Nova Scotia. The large scale commercial development of today had its beginnings in the late forties and early fifties. Since then, the industry has steadily expanded. Lowbush blueberries are the No. 1 fruit crop in the province in terms of total acreage and export sales, and closely rival apples in terms of total value to the province's economy.

In 1953, provincial production was 1,125,000 pounds with a farm value of $152,000. The five-year average production from 1984 to 1988 was 17,160,000 pounds with a farm value of $7,207,245 and a total value to the province's economy of over $21,000,000.

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SECTION I - PRODUCTION

PRODUCERS AND ACREAGE

There are over 1,000 producers in the province and about 26,000 acres in production. Acreage per grower varies from as low as one acre to well over a thousand acres by larger producers. Thus, annual production per grower can vary anywhere from a low of a few hundred pounds to a high of 1,500,000 pounds or more. Most growers operate their fields on a two-year pruning cycle. They try to have about half of their total acreage in crop.

PRODUCTION FIGURES

The table below gives annual lowbush blueberry production figures in Nova Scotia for the past thirty-three years. The table on the following page gives five-year average production figures.

Annual Lowbush Blueberry Production Figures in Nova Scotia

YEAR	(lbs.) PRODUCTION	YEAR	(lbs.) PRODUCTION
1956	4,020,000	1973	10,075,000
1957	4,800,000	1974	7,557,000
1958	3,000,000	1975	9,928,632
1959	5,200,000	1976	6,842,349
1960	5,400,000	1977	8,202,370
1961	5,700,000	1978	11,618,207
1962	7,400,000	1979	10,723,011
1963	7,000,000	1980	8,348,407
1964	5,100,000	1981	12,866,140
1965	7,000,000	1982	14,113,780
1966	7,600,000	1983	19,502,395
1967	11,500,000	1984	15,107,326
1968	2,100,000	1985	18,950,760
1969	8,882,000	1986	16,212,357
1970	8,200,000	1987	13,525,056
1971	7,100,000	1988	22,005,048
1972	9,897,000		

5-Year Average Production Figures - Nova Scotia

1959 to 1988

5-Year Period	Average Annual Production
1959 - '63	6,140,000 lbs.
1964 - '68	6,660,000 lbs.
1969 - '73	8,830,800 lbs.
1974 - '78	8,829,712 lbs.
1979 - '83	13,110,747 lbs.
1984 - '88	17,160,109 lbs.

The overall steady increase in production over the past thirty years has been due to a strong production base of privately owned land; continuous research and promotion of improved cultural practices by government; agressive and innovative industry entrepreneurs; ample modern processing facilities, and steadily expanding markets.

Years of unusually high production have been mainly due to a particularly favorable growing season with a good supply of moisture. The one year of exceptionally low production (1968) was due to a very late spring frost combined with a prolonged summer drought.

PRODUCTION AREAS

For the purpose of presenting a more accurate picture of lowbush blueberry production in Nova Scotia, the province may be divided into five production areas:

1) Cumberland County

2) Central Nova Scotia - includes counties of Halifax, Colchester and Hants

3) Western Nova Scotia - includes counties of Kings, Yarmouth, Digby, Lunenburg, Queens, Shelburne and Annapolis

4) Eastern Nova Scotia (Mainland) - includes counties of Guysborough, Antigonish, and Pictou

5) The Island of Cape Breton

Each production area has specific conditions or factors that have a bearing on blueberry production, yields and losses.

About 75 percent of our present production comes from Cumberland County. Although there is still undeveloped acreage which could be brought into production in this county, increased production here will result mainly from improved cultural practices. Yields are generally higher than other areas of the province. This is because development of large acreages took place first in this county, and many fields have been continually improved by a good cultural program over a long period of time. Also, the central part of this county has near ideal soil and climatic conditions for good blueberry production.

The central region has developed steadily during the past several years. This area has good climatic conditions and a good natural acreage base. Production from this region should continue to increase as more fields are developed and existing acreage is gradually improved.

A continued increase in the development and improvement of acreage in eastern Nova Scotia is expected during the next several years. Most fields in Pictou and Antigonish counties and the northern part of Guysborough County have very few weed problems and climatic factors appear favorable for development. Production potential on the large tracts of barren land in the southern and coastal areas of Guysborough County is not great because of climatic factors (i.e. short growing season, severe winterkill) and extremely rough terrain. Only a few of these fields are burned on a regular basis, and usually this is the only cultural practice followed. These fields are rough and rocky and, in most cases, they are owned by the province (Crown lands). With no private ownership and severe production constraints, there is lack of individual initiative to develop fields for higher production.

In the western part of the province (from Hants Co. westward), there are over 1,000 acres presently in production and many more potential acres which could be developed. This area has the natural advantage of a longer growing season. However, fields have historically been plagued with more weed problems than in other areas of the province. With the introduction of new and improved methods of weed control, there is a growing interest in developing new acreage in Queens, Lunenburg and Yarmouth counties.

Cape Breton Island has never produced satisfactory commercial yields. For years, this was attributed mainly to lack of sufficient heat units during the growing season in coastal areas where commercial development has been attempted. Several inland locations on the island are currently being developed for commercial blueberry production. It now appears that some of these areas have good potential, and that lack of a proper cultural and management program may have been the limiting factor in past commercial development attempts.

PRODUCTION METHODS

Growing a commercial crop of lowbush blueberries has developed into a fairly complex operation. A grower with any significant acreage is involved with

various production activities from early spring until late fall. While this booklet is not intended as a production manual, a brief description of the seasonal activities of the blueberry grower is presented here to give a capsule picture of the production methods used with this crop.

PRUNING

Pruning lowbush blueberries is done by flail mowing or burning in either the fall or early spring. Pruning gets rid of old growth and promotes the growth of vigorous new shoots which will produce a high yielding crop the following year. Usually, one-half of the total acreage is pruned each year. Burning is usually done with oil or gas burning machines. A few growers spread hay or straw in the fall and burn fields in the spring without the use of a machine. Flail mowing is cheaper than burning and is rapidly increasing in popularity as a pruning method on level ground. The blueberry plant produces only vegetative shoots the first season following pruning. The second year, blossoms and fruit are produced.

INSECT AND DISEASE CONTROL

At various times during both the sprout (first) and crop (second) years of growth, sprays may need to be applied to control insect and disease pests. These materials are applied either by aircraft or ground spraying equipment.

WEED CONTROL

Because of the semi-cultivated condition of blueberry fields, weed control is a continuous problem. The weed control program for most fields involves an overall pre-emergent spray in the spring of the sprout year followed by spot spraying to control escape weeds. Some spot treating of weeds may also be done following harvest during the crop year. Bush type weeds are cut and treated with herbicides while softer weeds are sprayed with back sprayers or tractor-mounted boom sprayers.

POLLINATION

Lowbush blueberry flowers must be insect pollinated. In order to ensure an adequate pollinating force, many growers place colonies of honeybees in their fields during the bloom period (three weeks during June). The hives of bees are usually removed once the bloom period is over.

HARVESTING

Harvesting on crop fields begins in mid August. Most harvesting operations involved organizing one or more picking crews to rake the berries which are then delivered to a collecting station or processing plant. Fields are divided into picking lanes with one raker assigned to each lane. Field supervisors, truckers, field weighers, stringers, etc. must be hired for large operations. If only a small acreage is involved, the grower may perform most of these duties himself. Harvesting usually lasts from one to four or five weeks depending on weather conditions and the acreage to be harvested.

In 1984, the first commercially successful mechanical harvesters were used on about 20 farms. There are now over 100 of these machines in use. A harvester can pick up to six ton of berries per day in high-yielding fields. However, their use is restricted to fields that are quite smooth and relatively free of weed growth. Harvesting costs with the machine average about half the cost of harvesting with a raking crew. In 1988, over 20 percent of the provincial crop was machine harvested. It is anticipated that mechanical harvesters will be used on more acreage each year.

OTHER

Besides these essential operations, many growers are involved in clearing new land for production and improvement of existing fields through fertilizing, drainage, constructing firebreaks, land levelling, etc.

PRODUCTION AND HARVESTING COSTS

The cost of producing and harvesting a pound of blueberries varies greatly from one grower to another depending on the program he follows, the yield per acre he obtains from his field, and whether his land can be mowed and mechanically harvested. As the yield per acre increases, the unit costs decreases accordingly. Most growers feel their cost for production and harvesting using traditional burning and hand harvesting is somewhere between 30 and 35 cents per pound.

The tables given on the following pages outline costs for a complete production program. Tables I and II give typical costs for a grower who prunes by burning and hand harvests his crop. Comparable costs for a grower who can flail mow and mechanical harvest are given in Tables III and IV. By using these figures, a grower can obtain estimates of the cost of producing and harvesting a pound of blueberries and make a comparison of cost versus different yields obtained. These figures are considered by extension workers to be realistic even though costs do vary considerably among different growers.

Table I - Production and Harveesting Costs Using Burning and Hand Harvesting

Production Cost Per Acre		Harvesting and Handling Costs	
Pruning (Burning)	$ 85.00	Harvesting & Supervision	14¢ to 18¢/lb
Fertilization	20.00	Equipment & Transportation	2¢/lb
Insect Control	15.00	TOTAL	16¢ to 20¢/lb
Disease Control	40.00		
Weed Control	55.00		
Pollination	20.00		
Taxes, Machinery, Equipment & Other Overhead Costs	20.00		
TOTAL	$255.00		

Table II - Variability of Total Production & Harvesting Costs Per Pound Due To Yield Variations (Based on Table I Cost Figures)

Yield	Production Cost	Harvesting and Handling Costs*	Total Cost
1,000 lbs/acre	25.5 ¢/lb ($255 per acre)	20 ¢/lb	45.5 ¢/lb
1,250 lbs/acre	20.4 ¢/lb ($255 per acre)	19 ¢/lb	39.4 ¢/lb
1,500 lbs/acre	17.0 ¢/lb ($255 per acre)	18 ¢/lb	35.0 ¢/lb
1,750 lbs/acre	14.5 ¢/lb ($255 per acre)	17 ¢/lb	31.5 ¢/lb
2,000 lbs/acre	12.7 ¢/lb ($255 per acre)	16 ¢/lb	28.7 ¢/lb
2,250 lbs/acre	11.3 ¢/lb ($255 per acre)	16 ¢/lb	27.3 ¢/lb
2,500 lbs/acre	10.2 ¢/lb ($255 per acre)	16 ¢/lb	26.2 ¢/lb
2,750 lbs/acre	9.2 ¢/lb ($255 per acre)	16 ¢/lb	25.2 ¢/lb
3,000 lbs/acre	9.5 ¢/lb ($255 per acre)	16 ¢/lb	24.5 ¢/lb

* Harvesting and handling costs have been varied from 20¢ to 16¢ to reflect the influence of good yields in lowering harvesting rates.

Table III - Production and Harvesting Costs Using Flail Mowing and Mechanical Harvesting

Production Cost Per Acre		Harvesting and Handling Costs	
Pruning	$ 35.00	TOTAL	10¢ to 12¢/lb
Fertilization	20.00		
Insect Control	15.00		
Disease Control	40.00		
Weed Control	55.00		
Pollination	20.00		
Taxes, Machinery, Equipment & Other Overhead Costs	20.00		
TOTAL	$205.00		

Table IV - Variability of Total Production & Harvesting Costs Per Pound Due To Yield Variations (Based on Table III Cost Figures)

Yield	Production Cost	Harvesting and Handling Costs*	Total Cost
1,000 lbs/acre	20.5 ¢/lb ($205 per acre)	12 ¢/lb	32.5 ¢/lb
1,250 lbs/acre	16.4 ¢/lb ($205 per acre)	12 ¢/lb	28.4 ¢/lb
1,500 lbs/acre	13.6 ¢/lb ($205 per acre)	11 ¢/lb	24.6 ¢/lb
1,750 lbs/acre	11.7 ¢/lb ($205 per acre)	11 ¢/lb	22.7 ¢/lb
2,000 lbs/acre	10.2 ¢/lb ($205 per acre)	10 ¢/lb	20.2 ¢/lb
2,250 lbs/acre	9.1 ¢/lb ($205 per acre)	10 ¢/lb	19.1 ¢/lb
2,500 lbs/acre	8.2 ¢/lb ($205 per acre)	10 ¢/lb	18.2 ¢/lb
2,750 lbs/acre	7.4 ¢/lb ($205 per acre)	10 ¢/lb	17.4 ¢/lb
3,000 lbs/acre	6.8 ¢/lb ($205 per acre)	10 ¢/lb	16.8 ¢/lb

* Harvesting and handling costs have been varied from 12¢ to 10¢ to reflect the influence of good yields in lowering harvesting rates.

Production costs vary considerably from grower to grower, depending on the condition of his fields, his location and his management program. The harvesting and handling cost per pound for hand raking varies with labor availability, yield per acre and field conditions. Mechanical harvesting costs will also vary depending on yield and field conditions. Growers with low yielding or poorly managed fields must pay higher harvesting costs than those with weed free, high yielding fields. Because of the great variations between growers' costs, it is difficult to determine meaningful average production and harvesting costs for growing lowbush blueberries. Each operation must be assessed on the basis of its production, location, yield, management plan and the variable cost factors mentioned on the preceding page.

The form below could be used by all growers in order to determine their own production and harvesting costs.

Production Cost Per Acre

Pruning	$	
Weed Control	$	
Disease Control	$	
Insect Control	$	
Pollination	$	
Fertilization	$	
Taxes	$	
Machinery & Equipment	$	
Miscellaneous	$	
TOTAL	$	_____ Per Acre

Harvesting Costs (Cents Per Pound)

Picking	_____	cents
Supervision	_____	cents
Supplies & Equipment	_____	cents
Transportation	_____	cents
TOTAL	_____	cents Per Pound

_____

The production cost per pound is calculated by dividing the yield per acre into the production cost per acre. By adding this cost to the harvesting cost, the total production and harvesting cost per pound is obtained. This can then be compared to the market price for berries to determine profit or loss per pound of berries produced (see form on next page).

Total Production and Harvesting Cost Per Pound

Production Cost Per Pound	_____	Cents
Harvesting Cost Per Pound	_____	Cents
Total Cost of Production and Harvesting Per Pound	_____	Cents

Profit or Loss

Market Value of Blueberries	_____	Cents Per Pound
Cost Production & Harvesting	_____	Cents Per Pound
Profit or Loss	_____	Cents Per Pound

SECTION II - MARKETING

THE MARKETING SYSTEM

The bulk of Nova Scotia's annual lowbush blueberry crop is sold to processors and frozen for eventual resale to blueberry product manufacturers. A well defined marketing system has evolved for getting the crop from the field to the end user. To help in describing this system, there are several terms which should be defined.

(1) A **grower** is a person who grows and harvests blueberries. He may or may not be a **buyer** or **processor.**

(2) A **buyer** is a person who buys blueberries from the **grower** and sells to the **processor.** He is usually, but not necessarily, a **grower** himself.

(3) A **processor** is a person who buys blueberries from the **buyer** or directly from the **grower.** He processes (freezes) these berries at his plant. They are then either resold immediately or stored and held for future sales. Some **processors** are also large **growers.**

(4) A **manufacturer** is a person who buys blueberries (mostly frozen but sometimes fresh) for use in the manufacturing of blueberry pies, tarts, muffins, etc., or other manufactured products.

The **buyer,** or middleman as he is sometimes called, is an important link in the marketing chain and has done a lot to develop the blueberry industry in Nova Scotia. He has helped to create a ready market for many small growers and has also provided them with a great many necessary custom services. There are approximately 30 **buyers** in the province of Nova Scotia at present (1989). Most of these **buyers** are also large **growers.**

Most **buyers** supply the necessary harvesting and marketing equipment, such as rakes, pails and field cleaners, to **growers.** Sometimes, they provide picking crews (paid for by **growers**) to harvest the crop. Boxes for harvesting and transporting the berries are provided by the **processor.** Most **buyers** and **processors** own burners and flail mowers and will custom-prune fields. Many **buyers** and **processors** also provide services such as weed control work, spraying and fertilizing, hives for pollination, etc. on a custom basis. All of this, of course, means that each grower does not have to invest a lot of money in supplies and equipment.

Most **buyers** have collecting points or receiving stations set up where they receive the blueberries. At these stations, the berries are weighed, cleaned and then shipped to a processing plant. All of the Nova Scotia production does not go through **buyers.** A considerable amount is grown by, or sold directly to, the **processor,** and some blueberries are sold fresh on the retail consumer market.

In 1988, 77 percent of Nova Scotia's production was shipped (either directly or via **buyers**) to Nova Scotia **processors,** and about 21 percent was shipped fresh by **buyers** to processing plants outside Nova Scotia (mostly in the state of Maine). Local fresh sales accounted for about 2 percent of total

production. Up until 1972, approximately 70 percent of the total Nova Scotia processed pack was usually sold to United States **manufacturers,** while the other 30 percent was sold to **manufacturers** in Canada. Beginning in 1972, increasing amounts of Nova Scotia berries were sold to European countries such as West Germany, Sweden, Norway and the Netherlands. From 1977 to 1982, over 60 percent of each year's crop was sold in Europe. Small quantities were sold in Japan in the late 1970's and this market increased steadily for about five years. Since then, there has been a levelling off of demand. Shipments to European markets declined substantially from 1983 to 1985 because of the strength of the Canadian dollar in relation to most European currencies. More favorable currency exchange rates returned in 1986 and have resulted in a revival of European sales since that time. In most cases, shipments of overseas markets are made by refrigerated containers through the ports of Halifax or St. John.

PRICES PAID TO GROWERS

Prices paid to the grower over the last thirty-three years are given as follows:

YEAR	AVERAGE PRICE (¢/lb)	YEAR	AVERAGE PRICE (¢/lb)
1956	10.5¢	1973	28 ¢
1957	12 ¢	1974	18.5¢
1958	12.5¢	1975	26.5¢
1959	10.5¢	1976	32 ¢
1960	10 ¢	1977	62 ¢
1961	9 ¢	1978	50 ¢
1962	8.5¢	1979	38 ¢
1963	12 ¢	1980	45 ¢
1964	15 ¢	1981	48 ¢
1965	24 ¢	1982	60 ¢
1966	16 ¢	1983	40 ¢
1967	7 ¢	1984	30 ¢
1968	17 ¢	1985	25 ¢
1969	15 ¢	1986	40 ¢
1970	21 ¢	1987	60 ¢
1971	16 ¢	1988	55 ¢
1972	24 ¢		

Prices over this period have fluctuated greatly from a low in 1967 of 7 cents to a high in 1977 of 62 cents.

The average price per pound received by growers in the 1950's was 11.8 cents; in the 1960's, this rose to 13.4 cents per pound. During the 1970's, the grower price averaged 31.6 cents per pound; and over the past eight years (1981 to 1988) the average grower price has been 45 cents per pound.

Beginning in the mid 1970's, a steadily increasing market demand was stimulated through promotional efforts in Europe and Japan by Nova Scotia's

growers and processors, and promotion both in North America and overseas markets by the North American Blueberry Council and the Wild Blueberry Association of North America. New markets in European countries and Japan lessened Nova Scotia's dependence on the U.S. market, and resulted in good prices to growers from 1975 to 1983. The lower prices in 1984 and 1985 resulted from inventory buildup from three successive high production years in most blueberry production areas of the world in 1983, 1984 and 1985. There is a continuing job to be done in selling blueberries in new market areas to cope with the rapid production increases which have occurred.

PROCESSING

There are two processing companies in Nova Scotia which freeze blueberries for resale to the manufacturer.

1) Cobi Foods Ltd. — Port Williams, Kings County, Nova Scotia

2) Oxford Frozen Foods Limited — Oxford, Cumberland County, Nova Scotia and Halfway River, Cumberland County, Nova Scotia

Both companies have Individual Quick Freezing (I.Q.F.) facilities in their plants and have access to adequate storage facilities to handle the amount of berries they process.

PROCESSING COSTS

An explanation of costs involved in processing and marketing lowbush blueberries is given below. Various costing systems are used by different processors but it is generally agreed that total processing costs, excluding transportation, duty and brokerge charges, will run between 35 and 50 cents per pound. Transportation costs vary with production destination. Duty and brokerage charges are a percent of the selling price, and vary with it. Total processing and marketing costs in 1988 ranged from 40 to 45 cents per pound depending on the variable costs noted above.

To illustrate the relationship of processing and marketing costs to finished product, consider the following example. If a processor pays 55 cents per pound for blueberries delivered to his plant, and his total processing and marketing costs based on the cost figures given on the preceding page, are 45 cents; then that processor must receive at least $1 per pound for the finished frozen product. This would simply cover costs and allow for no margin of profit. A brief explanation of some of the processing and marketing costs is presented below to give an indication of various items which make up the total cost picture.

SHRINKAGE

This item refers to the loss in weight due to dirt, small berries and other foreign material which is removed as the berries go through the cleaning and processing lines. The amount of shrinkage is variable but will usually run somewhere between 10 and 12 percent.

DIRECT COSTS

. Labour (handling and inspecting product as it moves from field or collecting station through the processing line and into cold storage)

. Short Term Interest . Storage . Containers and Supplies

. Taxes, Dues, Etc. . Electricity

OVERHEAD

This item includes all equipment and facilities, maintenance and repairs, insurance, company administration, interest on financing, depreciation, etc.

MARKETING COSTS

DUTY AND BROKERAGE CHARGES

These are a necessary part of the marketing process. They are calculated as a percentage of the selling price and vary with it. Duty does not apply to berries sold on the Canadian or U.S. market, but berries shipped to overseas markets may be subject to import duties as set up the importing country.

TRANSPORTATION CHARGES

These charges vary with the destination of the product but will generally run between four and six cents per pound for overseas destinations.

FRESH MARKETS

A small percentage of the annual lowbush blueberry crop is sold each year on the fresh market. There are about a dozen commercial operations marketing fresh fruit in Nova Scotia. About 470,000 pounds were sold fresh in 1988. The fruit is packaged in either 10-pound boxes or pint or quart containers. Sales are mostly to retail store chains or fruit stands. Some packers work with service clubs or other groups who sell 10-pound boxes of fresh blueberries as a fund-raising project.

Selling berries on the fresh market requires more labour and special materials

and equipment to do a proper job. There is, however, a good opportunity for development of substantial sales if a producer is willing to expand some time and effort to set up an efficient operation, develop a marketing system and put out a high quality product.

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